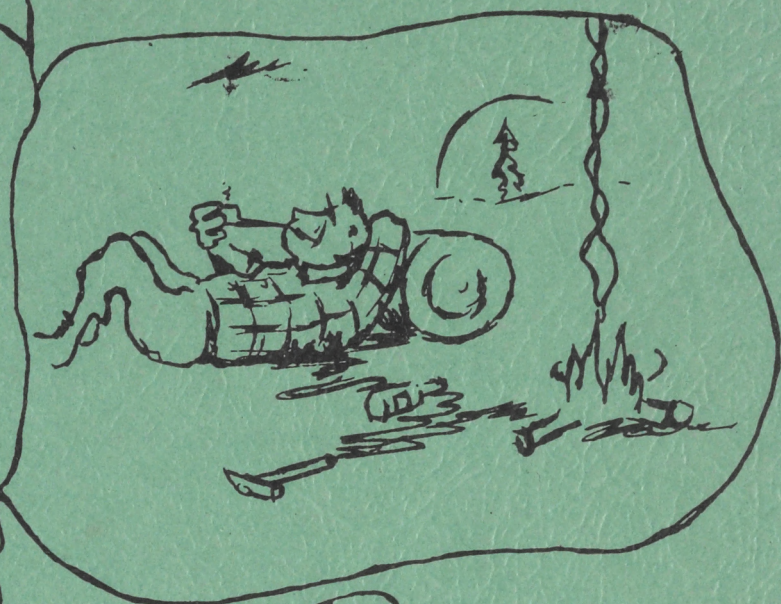
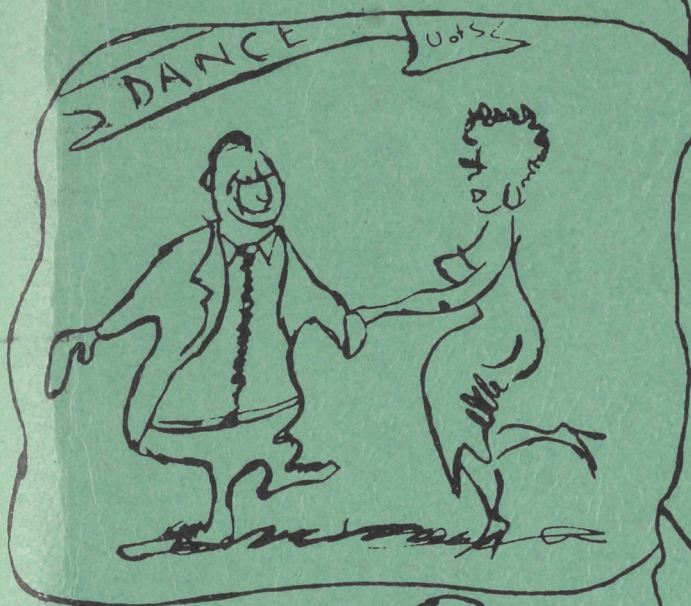


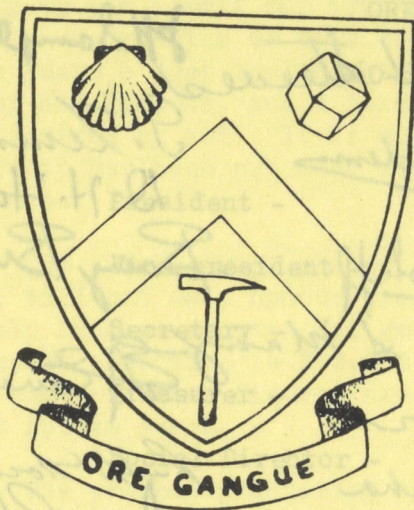
ORE

GANGUE



CONCENTRATES

Benetti



annual
publication of the
ore gangue,
geological society,
university of saskatchewan.

E E Zedenoys.
J. B. Maudslayi

W. D. Dindin

Tom Foster

CC Kime

I Hojnoll

AR Clark

Doug Cott

Joan Anderson

R. S. Arnold

Lester C. Coleman

AB Balasch

JD Seluque

U. G. Selindie

Lee Forsythe

W. A. Reed

D. H. Morton

Norm Hopper

Leo King

E. F. Paulmer

George W. Zlatoff

N. L. Schreiner

Patrick Achan

L. Hahl

Shamie

OK Kears

Doug Rice

Margaret Steeles

J. Miedema

W. H. H. H. H.

Lloyd & Mary

Halter

Majocha

Paul Lulio

W. A. Sykes

Owen Dixon

W. A. Karpman

W. A. Karpman

L. J. Joli

W. J. Calin

W. A. Calin

W. A. Calin

J. Cherry

W. Heimlich

M. Lutterford

W. A. Lutterford

W. A. Lutterford

Ralph D. Lutterford

J. D. M. Cleary

Shklein

Cathy

W. H. H. H.

W. H. H. H.

J. H. Sample

J. L. Lutterford

D. H. Hall

Darryl Bredwin

W. A. Lutterford

Luck North

Dave Pyke

Richard K. Johnson

J. A. Brandt

Honora Hoef

Fuson

W. A. E. Baldwin

AM Jath

EDITORIAL

Ore Ganguesters young and old, remember the simple elements in our lives! Few organizations are able to maintain a strong link between the past and the future as we say in our motto. More significantly we can credit our ORE GANGUE to the men who formed the foundation upon which we have built our organization. Throughout the years a deep feeling of respect and admiration towards Professors Mawdsley and Edmunds, and a form of expression this attitude has been and is desired by all. It is with this thought in mind that a scholarship has been proposed as a memorial to Professors Mawdsley and Edmunds.

President - D. W. Sykes

1960-61 EXECUTIVE

Vice-president - I. Zemmels

Secretary - L. J. Lambie

Treasurer - M. Rutherford (L. Kacsmar)

Social Director - H. Morton

3rd year Engineering

Representative - J. Cherry

3rd year Arts Representative - M. Larson

Scholarship Concentrates Editor - M. A. Roed

Assistants - E. Zederayko, L. Lambie,

W. Hamilton, W. Kaufmann,

F. Majocha.

Typist - Mrs. L. Sins

Front Cover - W. Longstaff

EDITORIAL

Ore Ganguesters young and old, remember the common elements in our lives! Few organizations are able to boast such a strong link between the past and the future as we may as geologists. More significantly we can credit our training largely to two men who formed the foundation upon which we have built our professional lives. Throughout the years a deep feeling of gratitude has grown towards Professors Mawdsley and Edmunds, and a form of expressing this gratitude has been and is desired by all. It is with this thought in mind that a scholarship has been proposed as a memorial to Professors Mawdsley and Edmunds.

The scholarship, presently in the initial stages of organization, will not only honour Professors Mawdsley and Edmunds but it will help finance a potential geologist in obtaining his education. The present objective is \$10,000 yielding an annual \$400.00 scholarship, however, these figures are not limits and the amounts may gain in future years.

The present graduating class was asked how much they would be able to donate within the next few years. A vote was taken and the response was more than encouraging with an overwhelming majority deciding upon a contribution of \$30.00 each. This not only indicates enthusiasm but it also gives Ore Ganguesters, who have been in industry for some time, a yardstick to help measure their donation to the Scholarship Fund.

In total there are 350 people who have been members of the Ore Gangue at one time or another. Statistics indicate that a 50 per cent response is a very optimistic assumption but it is confidently felt that with a little reflection of years past the proposed scholarship will be loyally supported in the age-old tradition of the Ore Gangue.

1960-61 Field Trip - Little Rockies

On Friday, October 7, 60 students accompanied by Professors Mawdsley, Edmunds, Byers, Kupsch, Caldwell, Wardlaw, and Dr. Christiansen of the Saskatchewan Research Council, left Saskatoon in a bus and two cars for the field trip south of the border.

On the first leg of the trip Dr. Christiansen pointed out numerous geomorphological features especially in relation to glaciation. Near Swift Current the stratigraphy of the Stewart Valley was examined and a stop was made south of Elrose to examine an outcrop of Bearpaw shale.

As in previous years the party found accommodation at Malta and the Malta Chamber of Commerce once again honoured the Ore Gangue with a banquet on Friday evening. Don Sykes, president of the Ore Gangue presented the mayor of Malta and secretary of the Chamber of Commerce with small souvenirs in token of our gratitude.

ORE GANGUE ACTIVITIES

The Fall Banquet

On November 19, 1960, the Ore Gangue Society held their first social function of the term - the annual fall banquet. Members gathered for a cocktail hour at Bob Lynn's and afterward enjoyed a buffet style cold plate.

Following the dinner, everyone enjoyed "a trip around the world in 80 minutes" featuring Professor Edmunds and his new ultra-automatic slide projector. Pictures of large cities, the countryside, and the people, of various parts of the world, including some burlesque, provided very good entertainment for the audience.

Winding up the function was a dance where members and their partners stuck to the motto - "Fellowship".

Float Entry

Not for several years had the Ore Gangue had an entry in the Homecoming Parade, so this year the Society decided to submit an entry, hoping that the tradition would be followed in later years.

The float was a success in several ways. To begin with, we won first prize in the Stunt Event, something later Ore Gangue Societies can strive to equal. Also, it showed the enthusiasm, desire, and ingenuity that our geologists do have. Without the combined efforts of the members the float could not have been built. Lastly, it provided another means for the rest of the campus to learn of our organization and our activities.

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After the banquet Friday evening, entertainment consisted of visits to the local bars and a general shake-down of the town, including investigation of a football game and high school dance.

Saturday morning saw a solemn but enthusiastic group of "hammer-bearers" on their way to the Little Rockies. Morrison Dome was visited first and three parties led by master students traversed the Jurassic-Cretaceous section. The next attraction was the Ruby Gulch Gold Mine at Zortman. A brief talk was given by the mine engineer after which Drs. Mawdsley and Byers led the group on a tour of the property expertly pointing out the various phases of the work and the geology. The end of the day was a time of refreshment for all and also a bit to eat at Lang's dining hall.

On Sunday the geologist's measured (in groups) the Paleozoic section at Brown's Gulch and collected many fossils.

On Monday morning the party returned to Saskatoon with a feeling of complete satisfaction. The enjoyable and educational time that everyone had could not have been accomplished without the high order of organization that was evident in this year's most successful field trip.

Wiener Roast

Before the weather became cold and the snowflakes started flying, we decided an informal get-together in the form of a wiener roast would prove beneficial in getting the new members of the Society acquainted with the senior students.

The wiener roast was held on Saturday, October 15, at Beaver Creek. Transportation was provided by several of the members who had cars. Expenses were divided among those who attended.

A downpour late in the evening, while dampening the environment, did nothing to dampen the spirits of the Ore Ganguesters. As someone put it, "I'm wet inside, so I might just as well be wet outside."

Stag

The first stag party in the history of the Ore Gangue was held on Friday, February 10, 1961.

The stag was held in a rumpus room at 1309 - 12th Street. Many thanks are extended to the gracious and understanding parents of Don Sykes.

Each member helped to provide refreshment and food. Any extraneous expense was divided among those present. Entertainment proved no problem.

According to all reports the stag was a success. Several members recall the milkman leaving extra milk. Noticeable, too, were some vacancies in class Saturday morning.

Programs at the Meetings

A varied and interesting series of topics were presented at the weekly meetings of the Ore Gangue this year. They are briefly outlined below.

Dr. W. O. Kupsch - Presented an interesting account of his trip to Iceland and his attendance at the 1960 International Congress at Copenhagen.

Murray Roed - "The Classification of Carbonate Rocks" according to the theories of Dr. Folk.

Mrs. Sins - Supplied an account of the origin of the Geology Library. Mrs. Sins went on to indicate the proper procedure to follow when looking for books in the library, the periodicals available, the Inter-library Loan System, and other facilities available to the students.

Gordon Sorli - "Keno Hill Mine Operations".

Nick Ferris - Summer work with Columbia Metals in Colorado, Nevada, and Utah.

Films - "The Earth's Rocky Crust", "The Riches of the Earth", and, "The Story of Nickel".

Bill Kaufmann - "Geology of southeastern British Columbia"

Dr. Mawdsley - "The Institute for Northern Studies" and Engineering Colloquium in the Biology Theatre.

Ted Faulkner - "Geochemical Prospecting". Mr. Faulkner also gave a practical demonstration in the practice of determining the relative amounts of minerals in organic and inorganic matter.

Ed. Zederayko - A slide illustrated lecture of his trip to Mexico.

Dr. Stumm - A lecture in the Biology Theatre entitled, "The Falls of the Ohio." Dr. Stumm is a world renowned paleontologist from the University of Michigan.

Dr. Mawdsley - Life history of two of Canada's former great geologists - Dr. George Dawson and Dr. Charles Cammell.

Projects

Projects carried out during the year by the Ore Gangue consists of:

Pool. During the World Series a baseball pool was run off for each game. A prize was given away for each game to the winner of the pool and a certain percentage of the proceeds were deposited in the Ore Gangue treasury.

Christmas Cards. With the view that in the future a slight profit could be made and put into the treasury, a design for Christmas cards was submitted to the printers and a plate cut. As the initial cutting of the plate and cost of printing was high, the cards were sold to the members at cost. Hereafter, the cost only of printing the cards will be slight, cards will be cheaper, and at the same time a small profit should be made.

Letterhead. Letterhead paper was another major project. This was considered an essential due to the fact that much correspondence is done by the club to other organizations, prominent figures in private and public industries, and also routine correspondence. The letterhead paper is also available to members who wish to apply for jobs, obtain information from companies for thesis work, etc.

Sample sorting. The British American Oil Company recently donated over 1000 boxes of rotary well cuttings to the Geology Department, representing 450, more or less completely sampled wells all in Saskatchewan. Unfortunately the well locations were not labelled on the exterior of the boxes. In order to facilitate future use of the samples, the Ore Gangue volunteered to label and orderly arrange the boxes according to township, range, etc. Through the efforts of Professor Edmunds a store room was obtained in the basement of the "Old Powerhouse" where for six weeks during the noon hour, a number of Ganguesters, under the direction of Bill Kaufmann, labelled, sorted and stacked the multitude of boxes. We wish to emphasize to future "thesis-writers" and laboratory instructors that these sample cuttings are for your use, hence feel free to utilize them.

Reorganization. A much needed reorganization of the map files was looked into. Under the efforts of Don Sykes, who led the project, the maps in the Geology Department have been sorted and catalogued.

Constitution amendments. Since its inception in 1934 the Constitution of the Ore Gangue, up until 1960, underwent little revision. In the spring of 1960, a barrage of amendments were submitted from the floor by a number of the Ore Gangue, these having to do mostly with election of officers to the active and honorary executive positions. After several stormy and often heated sessions, amendments were passed which changed elections by "show of the hands?" to elections by secret ballot. Candidates were urged to campaign and to submit their platforms in at least one speech. Other amendments of note were the establishing of third and second year representatives as executive members, and the electing rather than the appointing of the honorary president.

In the fall of 1960, the Ore Gangue appointed a committee, consisting of Owen Miedema, Alan Clark, Leo King and Bill Kaufmann, to conduct a complete investigation and reorganization of the constitution. The committee subsequently submitted several amendments and resolutions. Among these was the reinstating of the position of honorary president as an appointed position and the redefining of the term "active member". Although few of these amendments had the implication and controversial nature of those submitted the previous spring, they fill gaps and streamline the old constitution, bringing it in line with the size and activity of the present day Ore Gangue.

Sport by "Mort"

Another successful Ore Gangue Bonspiel was held this year with eight rinks entered. The games were played at the C. N. R. curling rink.

Malcolm Rutherford (1961-62 president) made a spectacular draw to the four foot circle to score an extra end victory over the Terry Colin rink in the "A" event final. Curling with Rutherford were G. Zbitnoff, J. Cherry and Donna Hogg.

Rutherford stopped D. Sykes and M. Roed and Colin turned back E. Zederayko and H. Morton on their way to the final.

Lionel Lambie came out on top in the "B" event final over the Blaine Scott quartet. Curling with Lambie were L. King, O. Miedema and N. Kopperud.

Suitable prizes were given to the Rutherford foursome and were consumed forthwith.

Hawkins once again honoured the Ore Gangue with their presence at the banquet.

A Look Around

The geology museum is no longer in one room. The need for space brought about by the greater-than-usual number of master students necessitated moving a number of cabinets out of the museum. The cabinets, containing fossils and mineral samples, are now located in the general geology lab where they are handy for the students in the introductory classes. A display case of ores of gold and uranium has been moved to a position in front of the bulletin board at the entrance to the library.

Miss Joan Anderson joined the department as secretary for the Institute for Northern Studies. The students express a strong desire that more additions like Joan be added as soon as possible.

A great asset to the department this year and for the future was the addition of a fully equipped photography dark room. This most important scientific tool has been especially beneficial to those students doing paleontological and petrological theses. The services of Dave Churchill, a true scientist in his field, were obtained as photographer for the department. Dave displayed a remarkable degree of tolerance to the fledging geological students who constantly demanded his assistance and guidance, and also handled the piles of work the professors thrust upon him. All in all the photographic facilities were kept in constant motion all year and we are all thankful for them.

Much hammering and sawing at the first of the year finally resulted in a stately row of cabinets for Dr. Coleman's mineral specimens. The cabinets now occupy most of the west wall of the mineralogy laboratory.

Ernie Hawkins now has two diamond saws with which to slice samples and keep pace with the rising demand of the students and professors. Although Ernie does a splendid and often unheralded job the Ore Gangue feel that his laboratory should be next on the list of modernization. We sincerely hope to see some changes in the near future.

Spring Graduate Banquet

The spring banquet in honour of the graduating students was held in the banquet room of Montrose Cafe. The toast to the Queen was given by president D. W. Sykes, followed by a toast to the graduates by J. Cherry which was replied by B. Breadner. K. Evans gave the toast to the faculty and Dr. Byers answered. Dr. Byers included a hilarious and we hope slightly exaggerated account of typical answers to examination questions in the fields of structural geology, paleontology, stratigraphy and structural geology. Mrs. Sins, secretary for the department, Miss J. Anderson, secretary for the Institute for Northern Studies, and Mr. Ernie

Hawkins once again honoured the Ore Gangue with their presence at the banquet.

The feature attraction of the night was a talk given by Dr. J. L. Usher, Geologist for J. C. Sproule and Associates, Calgary. Dr. Usher's talk was an account of the stratigraphy and structure of the last geological frontier of North America, namely the Canadian Arctic. It was evident that much work has been accomplished in this northland but only with a good deal of difficulty. The way of life, the economic problems and operational techniques were discussed and vividly illustrated by Dr. Usher. The slides Dr. Usher showed were more than representative of his extremely interesting talk on the Canadian Arctic.

Following were nominated for positions on the Ore Gangue Executive for the year 1960-61:
Dancing to a three-piece orchestra concluded a most successful event.

President - Rutherford, M. 4th year Geological Engineering
Zemmel, I. 3rd year Arts and Science Geology

Secretary - Clark, Ore Gangue Operation
Klein, G. 3rd year Arts and Science Geology

1960-61

September, 1960	- 64 memberships		\$ 96.00
October 11,	Float deficit	\$13.75	82.25
12,	Baseball pools	\$25.50	107.75
16,	Wiener Roast	2.00	105.75
November 22,	Fall Banquet deficit	42.17	63.58
26	Film rental	4.75	58.83
30	Profit on jacket sale	1.76	60.59
December 10,	Cost of Christmas cards and paper	71.58	
	Less sale of cards	<u>40.30</u>	
		31.28	29.31
	Approximately 100 cards on hand.		
December 21,	Christmas draw net	17.20	46.51
January 14, 1961	Crest sale	1.50	48.01
15,	Film rental	4.33	43.68
18,	Flyers from Printers	9.72	33.96
February 15,	Stag profit	5.50	39.46
March 10,	Spring Banquet deficit	<u>11.26</u>	<u>28.20</u>
	Balance		\$28.20

Concentrates Fund 1960-61

September 1960	Cash on hand	\$392.72
October	64 memberships	32.00 424.72
November	Concentrate subs.	10.00 434.72
	Interest on Bank Balance	4.29 439.01
	Balance	\$439.01

Elections for 1961-62 Executive

March came in like a lamb this year, but this was not indicative of the character of our spring elections. Colorful campaigning, with posters decorating the hallways of the department, and inspiring campaign speeches by the candidates produced an enthusiastic election. The interest of the members in the election was borne out by the turnout at the polls - 90 per cent of the eligible voters cast their ballots.

Closing date for nominations was Friday, March 3rd, with the campaign speeches being held on Monday, March 13th. The following were nominated for positions on the Ore Gangue Executive for the 1961-62 term.

President -	Rutherford, M.	4th year Geological Engineering
	Zemmels, I.	3rd year Arts and Science Geology
Secretary -	Clark, A.	3rd year Geological Engineering
	Klein, G.	3rd year Arts and Science Geology
Treasurer -	King, L.	3rd year Arts and Science Geology
	Kopperud, N.	3rd year Geological Engineering

The election was held on Tuesday, March 14th.

Congratulations and best wishes go out to the new executive and may they uphold the glorious tradition of the Ore Gangue. The successful candidates were;

President	-	M. Rutherford
Secretary	-	A. Clark
Treasurer	-	N. Kopperud

Geophysical Engineering:

Hajnal, Z.	'Near surface structures in gravity surveys'	Sask. Research Council, Saskatoon, Sask.
Teth, B.	'Application of the stratigraphic seismogram'	Imperial Oil, Weyburn, Sask. Chevron (Cal. Std. Crew).

Petroleum Engineering:

GRADUATE STUDENTS - 1961

Geological Engineering:

	<u>Thesis topic</u>	<u>Work 1960</u>	<u>Work 1961</u>
Balasch, A.			
Goliath, H.	'Ammonium nitrate-fuel oil blasting agents'	Eldorado Mining Co., Uranium City, Sask.	Inco, Thompson, Man.
Breadner, B.	carbonated waters		
Holter, M.	'Lower Cretaceous of southeastern Saskatchewan'	Texaco Explor- ation Co., N.W.T.	
Heinlick, Wm.			
Kendall, W.	'Bedrock topography of the Swift Current area'	G.S.C., Chalk River, Ont.	G.S.C.
Jelinek, G. A.			
Lambie, L. J.	'Diesel power in underground mine transportation'	D.M.R., northern Saskatchewan Idaho, Sask.	Inco, Oil Thompson, Man.
Majocha, F. V.	'Lower Cretaceous- Jurassic contact, eastern Saskatchewan'	Imperial Oil Ltd., Norman Wells, N.W.T.	Shell Oil Ltd.
Ruse, D.	'Stress distribution around rectangular openings'	G.S.C. Western Ontario	Inco, Thompson, Man.
Rutherford, M.	'Petrological study of the gangue minerals in the Coronation mine ore'	G.S.C., Coronation Mine, Flin Flon.	G.S.C., Ltd.
Dixon, O. A.	'Spiriferids from the	D. M. R.,	California
Scott, B. P.	'Alteration products of basic rocks, Chantrey Inlet, N.W.T.	Inco, Chantrey Inlet, N.W.T.	D. M. R. Oil Ltd.
Sorli, G.	'Mineralogical study of the silver ores from United Keno Hill Mines, Ltd.'	United Keno Hill Mine Ltd., Keno Hill, Yukon.	

Geophysical Engineering:

Hajnal, Z.	'Near surface structures in gravity surveys'	Sask. Research Council, Saskatoon, Sask.	
Poth, D.	'Application of the stratigraphic seismogram'	Imperial Oil, Weyburn, Sask.	Chevron (Cal. Std. Crew).

Petroleum Engineering:

	<u>Thesis topic</u>	<u>Work 1960</u>	<u>Work 1961</u>
Balasch, A.	'Athabasca Tar Sands'	Asphalt Services, Saskatoon, Sask.	Texaco Oil Ltd.
Breadner, B.	'Recovery of oil using carbonated waters'	Mannix Constr., Squaw Rapids, Sask.	Shell Oil Ltd.
Heimlick, Wm.	'Mechanics of hydraulic fracturing'	Halliburton of Canada, Estevan, Sask.	
Jelinski, G. A.	'Tubingless completions'	G.S.C., Rocky Mountains	
Longstaff, Wm.	'Acidization of oil wells'	Shell Oil Ltd., Regina and Midale, Sask.	Shell Oil Ltd.
Selinger, D.	'Sonic pumping equipment and performance'	Iron Ore of Canada, Schefferville, Quebec	

Arts and Science:

Copper, P.	'Middle Devonian auloporides from the Hume fm., N.W.T.'	D.M.R., Northern Sask.	Shell Oil Ltd.
Dixon, O. A.	'Spiriferids from the Hume fm., N.W.T.'	D. M. R., Northern Sask.	California Standard Oil Ltd.
North, R. B.	'Foraminifera of the Bearpaw formation of Saskatchewan'		
Rainsberry, L. E.	'Study of pollen and spores, Blainmore Saskatchewan'		Shell Oil Co., of Canada, Ltd., Edmonton, Alta.
Roed, M. A.	'Mid-Devonian productellid and chonetid brachiopods from Northern Canada'		Shell Oil Co. of Canada, Ltd. Edmonton, Alta.
Sykes, D. W.	'Devonian martinitidae from Northwest Territories'		Pan American Petroleum Corp., Calgary, Alta.

MASTER STUDENTS - 1961

	<u>Thesis topic</u>	<u>Work 1961</u>
Evans, J. K.	'Stratigraphy of the Cretaceous Bearpaw formation in the South Saskatchewan River Valley'	Shell Oil Co. of Canada, Limited, Edmonton, Alta.
Eweida, E.A.F.M.	'Hydrogeological studies in Ponoka area, Alberta.'	
Faulkner, E. L.	'Colourimetric determination of trace elements in pyrrhotite'	Ph.D. University of Saskatchewan.
Ferris, C. S. Jr.	'Pyrrhotite as a geothermometer'	Hawaii
Frison, E. H.	'Mid-Devonian cerioid rugosan corals from Northwest Territories'	Shell Oil Co. of Canada, Ltd., Edmonton, Alta.
Hamilton, W. N.	'Mineralogy of the Bearpaw formation'	Pan American Petroleum Corp., Calgary, Alta.
Kaufmann, W.L.M.	'Petrology of the "Upper Madison" Southal area, Saskatchewan'	Shell Oil Co., of Canada, Ltd., Calgary, Alta.
Miedema, O.	'Early Mid-Devonian corals of Northern Canada'	Pan American Petroleum Corp., Calgary, Alta.
North, R. B.	'Foraminifera of the Bearpaw formation of Saskatchewan'	
Rainsberry, L. E.	'Study of pollen and spores, Blairmore Saskatchewan'	Shell Oil Co., of Canada, Ltd., Edmonton, Alta.
Roed, M. A.	'Mid-Devonian productellid and chonetid brachiopods from Northern Canada'	Shell Oil Co. of Canada, Ltd. Edmonton, Alta.
Sykes, D. W.	'Devonian martiniidae from Northwest Territories'	Pan American Petroleum Corp., Calgary, Alta.

Squair, H.	'The Forte a la Corne iron deposit'	Giant-Yellowknife Yellowknife, N.W.T.
Zederayko, E. E.	'The Cretaceous Colorado in Eastern Saskatchewan'	

The Institute for Northern Studies, University of Saskatchewan was authorized and Dr. J. B. Mawdsley was appointed its first Director in January 1960. It does not intend to have a research staff of its own but aid as much as it can interested members in the various university department, and their graduate students. Its fundamental objectives are: 1. to aid original research work of an academic nature on northern problems, and 2. to aid the training of humanists, scientists. The judge looked up from the bench to see a familiar face before the bar. "I've had you up here for speeding, drunken driving, reckless driving, parking in front of the Engineering building and beating up a cop, and the last time you were here I impounded that green bomb you drive, what the hell is the charge this time?"

Kieth looked up sheepishly and said, "Jay-walking, your honor". The initiation of the Institute the Board of Governors of the University foresightedly placed some money at its disposal and this financed the 1960 fiscal year. * * * * * Six graduate students were involved. Three as a team obtained detailed and reconnaissance information to do with their three specialties, plant ecology, mammals. From the same materials, one man builds cathedrals, crosses the another hovels. La Ronge, Cree Lake and Stony Rapids. Two economists looked into the two subjects of cost of transportation in the Mackenzie River Basin and * * * * * mining in the Athabasca District. The living expenses were paid of a geologist, E. L. Paulkne. All ambitions are lawful except those which climb upward on the miseries of credulities of mankind. Canada investigating the origin of the Coronation mine deposit in the Flin Flon area. * * * * *

We make a living by what we get; a life by what we give. Government departments, bureaus and institutions interested in the vital matter of research * * * * * of graduate students for northern work. It is envisioned that in the future many students. "Be not deceived by the first appearance of things, but give thyself time to be right" - Wm. Penn. training.

* * * * *

"Nobody ever listened himself out of a job" - Calvin Coolidge. Great things are done by the man who toil for oil.

* * * * *

"I liked him very much when I first met him, but he talked me out of it" - Shirley Booth.

* * * * *

INSTITUTE FOR NORTHERN STUDIES

University of Saskatchewan

The Institute for Northern Studies, University of Saskatchewan, was authorized and Dr. J. B. Mawdsley was appointed its first Director in January 1960. It does not intend to have a research staff of its own but aid as much as it can interested members in the various university department, and their graduate students. Its fundamental objectives are: 1. to aid original research work of an academic nature on northern problems, and 2. to aid the training of humanists, scientists, engineers and others interested in northern problems and the present and future inhabitants in this important part of Canada. The north and northeastern part of Saskatchewan crosses much of the climatic zone comprising the Sub-Arctic of Canada and is an ideal research and training ground. Obviously the University of Saskatchewan is in a strategic position to use it. Especially as the Provincial services operating there are very interested and helpful.

On the initiation of the Institute the Board of Governors of the University foresightedly placed some money at its disposal and this financed the 1960 field program. Six graduate students were involved. Three as a team obtained detailed and reconnaissance information to do with their three specialties, plant ecology, mammals and birds, and biting insects, at three stations across the climatic zone, La Ronge, Cree Lake and Stony Rapids. Two economists looked into the two subjects of cost of transportation in the MacKenzie River Basin and the cost of mining in the Athabasca District. The living expenses were paid of a geologist, E. L. Faulkner, a Ph.D. candidate at Saskatchewan, working as part of the team under the over all direction of the Geological Survey of Canada investigating the origin of the Coronation mine deposit in the Flin Flon area.

It is hoped to receive support for the Institute from Government departments, bureaus and institutions interested in the vital matter of research and training of graduate students for northern work. It is envisioned that in the future many students interested in research to do with the North will turn to the University of Saskatchewan for their training.

"Great things are done in the land of the midnight sun by the men who toil for oil."

VISIT OF PROFESSOR ERWIN C. STUMM OF THE UNIVERSITY
OF MICHIGAN

During the last two years, Dr. Caldwell and many research students specializing in palaeontology and biostratigraphy have been studying the faunas of the Middle Devonian rocks on the flanks of the Mackenzie River valley in the Northwest Territories. The work has involved comparison of these faunas with those found in other parts of North America and in Europe and it has become evident that the northern faunas are quite different from those found in the equivalent rocks of the Appalachian region but impressively similar to those described from the Rhine valley of Germany. To have these interesting conclusions confirmed, and to get advice on the preparation and identification of the fossils, the Department invited Professor Erwin C. Stumm of the University of Michigan, an international authority on Palaeozoic corals, to visit the University during late January. Professor Stumm examined the collections and endorsed the view that the fossils had a distinct German affinity, pointing out also that they compared with material he had described some years ago from Nevada. Professor Stumm spent much of his time working with the research students, who report that they profited enormously from discussions with him and were most encouraged by his enthusiastic comments.

Professor Stumm delivered a formal lecture entitled "The Falls of the Ohio and its coral fauna" to a large audience that included many members of the Geological, Biological and Archaeological Societies. His talk dealt with research work he has been conducting during the last ten years on the stratigraphy and palaeontology of the Siluro-Devonian limestones exposed on the Ohio River near Louisville, Kentucky, the results of which should be published shortly by the Geological Society of America in the Memoir series. His delightful lecture was well received and was followed by an interesting discussion.

Since returning to Michigan, Professor Stumm has presented to the Department a set of the Contributions to the Museum of Palaeontology of the University of Michigan and other books that will be most useful in research work.

The Department is indebted to Professor Stumm, not only for leaving the comparative comfort of Ann Arbor to visit Saskatoon during the chilly month of January, but also for patiently and giving willingly us all the advice and help that he could, and for **making** such a generous donation to our growing palaeontological library.

FACULTY ACTIVITIES

THE INTERNATIONAL GEOLOGICAL CONGRESS

Dr. W. O. Kupsch

A strong contingent consisting of Dr. Mawdsley, Professor and Mrs. Edmunds, Dr. and Mrs. Christiansen, Dr. Caldwell, Miss Ruth North, Mrs. Kupsch and myself, more than adequately represented the University of Saskatchewan at the XXI International Geological Congress held in Copenhagen, Denmark, from August 15 - August 25, 1960. For most of us the congress was only a small part of a more extensive visit overseas and actually more knowledge, geological and otherwise, was gained from the various trips through Europe than from the attendance of lectures at the congress itself.

The International Geological Congress, the oldest international scientific congress in existence, held its first meeting in Paris in 1878 during the International Exhibition, for which the Eiffel Tower was built, and convened at generally three- to four-year intervals ever since, except for war periods. Its meetings are held in various countries all over the world at the invitation of a government or several governments, such as the meeting in Copenhagen, which was organized by the five Nordic nations: Denmark, Sweden, Norway, Finland, and Iceland. Field trips, before and after the meetings, are an important part of the congress.

Dr. Mawdsley visited Sweden and Norway on respectively a pre- and post-congress excursion. Professor and Mrs. Edmunds sailed along the coast of Norway on a cruise to the fjords before coming to Copenhagen, and Dr. Christiansen joined a trip covering about all of Denmark to examine Upper Cretaceous outcrops and their glacial cover. I enjoyed a really interesting visit to Iceland which provided an opportunity to study not only the volcanic activities and glaciers, for which the island is justly renowned, but also many other features of general geological interest. Drilling for steam, fissure eruptions, tillites of Pleistocene age, sea cliffs, waterfalls, gigantic grabens, and numerous other geological and scenic attractions fascinated the more than 50 participants from many different countries. I felt fortunate indeed to be one of them and to have the trip made possible through a travel grant received from the National Research Council.

At the meetings in Copenhagen we had an opportunity to meet other geologists, although it was not always easy to get a hold of someone you wanted to find. Several thousand delegates were in attendance, papers were presented simultaneously in various buildings, and a general atmosphere of bewildering, organized confusion reigned. With that and with the copious Danish dinners, liberally washed down with alcoholic beverages, it is obvious that a strenuous but enjoyable time was had by all.

FACULTY ACTIVITIES

Social

A highlight for the graduate students, in geology this year was an informal social evening in late January aboard H.M.C.S. Unicorn as wardroom guests of Dr. J. B. Mawdsley and Professor F. H. Edmunds.

Among those present were President and Mrs. J. W. T. Spinks; Dr. E. C. Stumm, Museum of Paleontology, University of Michigan; the late Dr. D. S. Rawson and Mrs. Rawson, Dr. and Mrs. J. G. Remple, and Dr. and Mrs. L. G. Saunders, of the Biology Department; Dr. D. W. R. Wilson, and Dr. R. Sullivan, of Shell Oil Company of Canada's exploration staff; together with members of the Geology Division of the Saskatchewan Research Council and staff members of the Geology Department with their wives and ladies.

Following introductions and cocktails, the landlocked craft weighed anchor; with Captain Mawdsley on the bridge and Professor Edmunds conning the helm, they transported the company on a cruise of Canada's northland and the Arctic, following by means of colored slides the course of a trip taken in 1960 by Dr. Mawdsley in conjunction with his work as Director of the Institute for Northern Studies. At every port of call, there was awakened in the audience, a new awareness of the multitude of problems which must be resolved before our nation will be able to tame this vast and wild frontier.

Returning to the home port, the travels were culminated by the serving of a delicious buffet lunch. Presently, all hands found themselves back on solid ground, carrying home memories of a wonderful evening.

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Dr. J. B. Mawdsley - Summer 1960

After attending the meeting of the Royal Society of Canada in Kingston, in the first week of last June, I boarded a T.C.A. jet on June 15th and six hours later landed at the London airport. The next six weeks I spent seeing various parts of England with the help of cousins strategically placed in London, near Oxford, near Chester and in the Lake District of northwest England, and with their guidance saw much of this interesting and beautiful country. As well I joined the Edmunds on a trip to Glasgow and Aberdeen. While in Glasgow we called on Dr. Caldwell's parents on Great Cumbrae in the Firth of Clyde and reported on the recent doings of their son. In Aberdeen we had a very pleasant reunion with the Lothians. Professor John Lothian, now on the staff of the University of Aberdeen, was formerly head of the English Department at the University of Saskatchewan. They

showed us much of the picturesque and historical parts of this corner of Scotland. We then went to Bristol where relatives of Professor Edmunds took us on a well planned and interesting trip to the "West Country", Somerset, Devon and Cornwall. We visited fascinating fishing villages, the bleak Dartmoor moors, past abandoned tin mines and operating kaolin workings. As elsewhere on these Islands things of historic interest from Roman fortifications to beautiful abbeys and thatched, hospitable pubs were to be found in profusion.

On July 25 I flew to Oslo and spent four days in the friendly and interesting capital of Norway. The fact that the Canadian ambassador to Norway, Dr. R. A. MacKay, was a graduate student at Princeton at the same time I was, was not a handicap. In Stockholm, a beautiful and wealthy city, I joined fifteen others on a very pleasant and very well arranged twelve day tour in southern Sweden under the guidance of Professor Sven Gavelin and Dr. P. H. Lundergardh to do with the origin of gneisses and granites. The evidence was presented in such an orderly and complete manner that one was aghast to find that at the end of the tour you were a granitizationist and as well were half convinced that you were an extreme proponent of it.

From the 15th to the 26th of August I was in Copenhagen at the well organized International Geological Congress. However, there were too many papers and no time for discussion. At future congresses there should be a radical reduction in the number of papers presented and more time for discussion. However, we were royally entertained, many old friends were present and Copenhagen is a very attractive city with excellent shops.

On August 27th in Oslo I joined a motley, two-bus-load of geologists. For the next ten days we made our way through southern Norway to Stavanger and then by coastal steamer to Bergen and Trondheim, sixty-four degrees North latitude. During the first part and north of Trondheim we visited iron, titanium and copper mines and a number of pegmatite deposits. Not only was the geology interesting, but the open handed hospitality of the Norwegians and the grandeur of the scenery of their country made it an unforgettable trip. Like the rest of the Scandinavians they have a deep love and pride in their country, which is evident in the neat and tidy flower-bedecked houses, towns and villages and the flag poles before most of their houses from which the flag of Norway often flies.

On September 8 I flew from Trondheim, the ancient capital of Norway, to Oslo, London and home with the fixed intention of again seeing these hospitable lands whose freedom-loving people of high individual integrity, have a great interest in Canada.

Professor F. H. Edmunds - BRAND IV

The geological EVENT of the summer of nineteen sixty was the XXI Session of the International Geological Congress held in Copenhagen where over two thousand geologists met for ten days in August. A notable feature of the Congress, that passed unnoticed, was that among the galaxy of geologists there were six from Saskatoon, three of them accompanied by their wives.

The five Scandinavian countries were hosts and their respective geologists had organized field trips for both before and after the Congress and it is about one of these trips, one in Norway and I wish to comment. First, however, I wish to pay tribute to the organization of the Congress and also to the three countries that I visited, Denmark, Norway and Sweden where the courtesy and kindness shown to strangers was exceptional. The general cleanliness and absence of litter is truly remarkable and I began to feel guilty when I threw a match stalk on the ground.

Our choice of trip was made because of its variety of mountain, fjord and coastal geomorphology and geology. My wife and I joined the excursion at Finse which is on the Oslo-Bergen railway, at about the highest point with an elevation of over four thousand feet. There is little at Finse other than Precambrian rocks and snow tunnels. There are no roads but there is a good hotel because of the importance of the area as a skiing centre. Near the hotel there is a memorial to Scott, Oates and the other famous Antarctic explorers who lost their lives near the South Pole in 1912. Finse had been their training ground.

The party that assembled for the excursion numbered sixty nine and were of thirteen nationalities. Thirty seven Americans, five Frenchman, four Canadians and representatives from East Germany, Italy, India, etc. The leader, Dr. Hans Holterdahl of the Geological Institute, Bergen, was accompanied by his wife and two assistant leaders. Two days were spent in the mountains, in the shade of Hardangerjokel (jokel means glacier) and then we worked our way, by train, on foot or by bus, down the Flam Valley to Aurlandsfjord and Brand IV. Brand IV was to take us into a multitude of fjords; then out to sea threading its way among the islands and into Romsdalsfjord where we would disembark at Andalsnes after six days aboard. After saying goodbye to Brand IV we would take the bus to Dombas, a town on the Trondheim-Oslo railway, thence by rail to Oslo and from Oslo to Copenhagen and the Congress.

It was a perfect day in the Flam Valley as we found our way down to Aurlandsfjord and Brand IV. We had lunch high upon the valley side with a magnificent view of well wooded slopes and a superb hanging falls, glinting in a blaze of sunlight. Below, in the shade, a nick along the valley wall showed where the fjord had, at some past time, stood with its beach four

hundred feet above present sea level and some five miles up valley from the end of the present fjord. After lunch we climbed to see giant potholes, thirty feet in diameter, churned out by a mighty torrent, that with the recession of the ice had ceased. Even though we were surrounded by a multitude of geological and scenic wonders, there was eager anticipation of the time ahead when we should be cruising along the fjords on Brand IV and visiting valleys as beautiful as Flamsdalen, or even more beautiful, where glaciers terminated in the valleys and the generations of valley development could be studied more fully. As the anticipation of the party increased the leaders seemed to become depressed and when we reached the fjord we realized the reason for their depression. Brand IV from a distance looked small and she seemed even smaller on closer approach. I think we had been expecting to see a beautifully appointed yacht, with beautiful lines, gleaming white and strung with flags, like the pictures in travel folders. Brand IV fell far short of this, she was white it is true, but a dirty white with many brown stains, her lines were not those of beauty, and her flags, faded and drooping, reminded me of last year's Christmas decorations that are sometimes seen in Saskatchewan small town hotel dining rooms in August. On board the smell, too, was reminiscent of some Saskatchewan eating joints. How were sixty nine of us to live, eat and sleep on Brand IV for a week? No wonder the Holterdahls had felt depressed at the thought of this introduction of their guests to fjord life.

My wife and I had one of the larger cabins for two, it was six foot square, fitted with two bunks, two hooks for clothes and a wash basin with a small tap that could dribble cold water. Between the upper bunk and the ceiling there was a full two and half feet clearance and every time I raised my head I hit the roof. An apple box shelf above the pillow added to the discomfort but that was easily fixed by putting the pillow at the other end of the bunk. The box contained a bible and sunday tracts, all in Norwegian and of no particular comfort except that they gave the clue to Brand IV's nautical status. She was a gospel ship and her usual service, that of cruising the Norwegian coast and fjords with devotees of some peculiar sect at low cost. She was the only vessel that could be hired within the budget set by the Congress officials. The Holterdahls had grave misgivings with regard to the acceptability of Brand IV as a floating hotel by Congress members, particularly by thirty seven Americans, male and female. No liquor was allowed on board but the Holterdahls had persuaded the ship's management to let them take wine, and beer was served as a normal part of the menu at lunch and dinner.

The dining salon was in the bowels of the ship and was reached by a companionway that sloped at sixty five degrees. I don't know how seventy, of us managed to dine together but trestles and benches were well crowded and so were we. The food was good but boiled halibut, hot or cold, gets monotonous more than once a day. I went first to Holland and spent a few days with Dr. Kupech's family in their homeland and then motored

We were most hospitably entertained at several towns along the coast and at one, the three course dinner that we were looking forward to very eagerly turned out to be Halibut, Halibut and Ice Cream. Of special note at this particular dinner was the speech given by one of the town councilors, a keen historian and archaeologist, who spoke in both perfect English and French. At another dinner off ship we had most delicious roast reindeer.

When the time came to leave Brand IV at Andalsnes there was a distinct feeling of regret. The Captain and crew had done everything they could to make us comfortable and the stewardesses did an amazingly good job under very cramped conditions. The Holterdahls were happy that there had been no non-geological conflicts amongst their charges and that there had been no complaints or grumbling. They had contributed very largely to the most enjoyable and harmonious time we had spent on Brand IV. Actually there was only one thing wrong with Brand IV. She had no bath room and only one small shower. Even American geologists and their wives, as well as other nationals, can stand a little dirt and enjoy it.

In May, 1960, I attended the First Joint Technical Meeting of the Petroleum and Natural Gas Engineers of the CIM and the Rocky Mountain Petroleum Sections of the Society of Petroleum Engineers of AIME held in Calgary, and presented a paper entitled 'A Study of Chamber Lift'.

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Dr. A. R. Byers - Summer, 1960

Current research includes a theoretical study of the pressure. After attending the Royal Society Meeting at Kingston I took on the job of supervising the building of a cottage on one of the Thousand Islands in the St. Lawrence River near Gananoque, Ontario. This pleasant work was interrupted during July and part of August by having to return to Saskatoon in order to teach Geology 101 at Summer School. On the trips to and from Saskatoon visits were made to the Blind River-Elliott Lake area, and Keweenaw Peninsula.

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Dr. D. H. Hall - Geophysics

During the past summer I was engaged in the application of geophysical prospecting. During the early part of the summer I spent several weeks in the employ of the Shell Oil Company examining outcrops of Devonian rocks in the front ranges of the Mackenzie Mountains in North West Territories. Some extensive collections were made and, as in previous years, the Shell Oil Company has permitted much of this material to be brought to the University for research purposes.

Dr. W. G. E. Caldwell - Summer 1960

During the early part of the summer I spent several weeks in the employ of the Shell Oil Company examining outcrops of Devonian rocks in the front ranges of the Mackenzie Mountains in North West Territories. Some extensive collections were made and, as in previous years, the Shell Oil Company has permitted much of this material to be brought to the University for research purposes.

Early in August I left the rainswept Mackenzie Valley for sunny Europe principally to attend the XXI International Geological Congress in Copenhagen. I went first to Holland and spent a few days with Dr. Kupsch's family in their homeland and then motored

with them through Germany to Denmark. Following a most successful Congress I returned to Britain and had a short holiday at home before flying back to Saskatoon.

My research has involved a study of the iron sulfides with the object of finding out more about their properties of these minerals in general and, especially, the temperature and pressure at which they might have crystallized in nature. Both naturally occurring minerals and minerals synthesized at this University are being studied.

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Professor T. E. W. Nind - Petroleum Engineering

In the early part of the summer I acted as Chairman of a committee set up by the Saskatchewan Oil and Gas Conservation Board to prepare and to present before the Board a Geological and Engineering Study of the Nottingham North Alida Beds Pool. Later in the summer I spent six weeks in Princeton, New Jersey, helping to give two courses in petroleum production engineering on behalf of Shell Oil Company. In addition I visited the laboratories of Shell Development Company in Houston.

In May, 1960, I attended the First Joint Technical Meeting of the Petroleum and Natural Gas Division of the CIM and the Rocky Mountain Petroleum Sections of the Society of Petroleum Engineers of AIME held in Calgary, and presented a paper entitled 'A Study of Chamber Lift'.

Current research includes a theoretical study of the pressure losses involved in the flow of oil and free gas through vertical pipes, and a study of the value to be assigned to delayed oil production. In the laboratory two new pieces of equipment for the measurement of permeability were designed, and built in the Machine Shop.

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Dr. D. H. Hall - Geophysics

During the past summer I was engaged in the application of geophysical prospecting to problems of ground water, and preliminary work on sample collecting and instrument construction for studies of rock magnetism.

This coming summer my research will entail field and laboratory investigations on rock magnetism, and field work in seismic exploration.

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Dr. R. G. Arnold - Research

My activities have involved a study of the iron sulfides with the object of finding out more about their properties of these minerals in general and, in particular, the temperature and pressure at which they might have crystallized in nature. Both naturally occurring minerals and minerals synthesized at this University are being studied.

A second project initiated last summer involves the measurement of trace element concentrations in sulfide showings located in the Flin Flon area using the Geology Department's new X-ray fluorescence spectrometer. This work is a part of a larger study of the variation in concentration of trace elements in the host rocks surrounding ore deposits which is being undertaken by Dr. Smith in the same area.

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Dr. N. C. Wardlaw - New Addition

Dr. Wardlaw joined the faculty in January, 1960 as Special Lecturer in Sedimentation. He was born at St. Augustine, Trinidad, on November 22, 1935. From 1940 to 1954 he obtained his primary and secondary education at the following schools: King's School, Macclesfield,; Manchester Grammar School; Cheadle High School, Cheshire. In 1957 he graduated with first class honours in geology from Manchester University. Following this he attended Glasgow University and was engaged in research work conducted during the tenure of a grant from the Department of Scientific and Industrial Research and under the supervision of Professor T. N. George to provide substance for a doctoral thesis. His doctoral thesis is entitled "Lower Carboniferous rocks of the Ardfinnan-Mitchelstown Syncline, County Tipperary".

During the period May - September in 1960, Dr. Wardlaw returned to Glasgow and completed the writing up of his doctoral thesis, which was then presented for examination and passed.

In addition to teaching several classes here at the University Dr. Wardlaw is presently engaged in a detailed petrographic and stratigraphic study of the Middle Devonian Prairie Evaporite formation in a part of south-central Saskatchewan.

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Dr. L. C. Coleman - New Addition

Dr. Coleman came to the University in the fall of 1960 as a Assistant Professor of Mineralogy and Petrology. He was born in Toronto, Ontario in October, 1926. He obtained his elementary and secondary schooling in Toronto following which he attended the University of Toronto as an undergraduate student. In 1950 he graduated with Honours B.A. in Geology from Queen's University and obtained an M.A. from the same University in 1952. The next three years were spent at Princeton University where he graduated with a Ph.D. in 1955. Both of his post-graduate theses were on the mineralogy of the Yellowknife gold ores (American Mineralogist 1953, Economic Geology, 1957).

Concerning field work Dr. Coleman has done geological mapping and mineral exploration in the Artillery Lake area, N.W.T., the Timmins region of Ontario; the Lake Mistassini region of Quebec; the Notre Dame Bay and Gander River areas of Newfoundland, and Aroastock County, Maine. His most recent field work has been the exploration of gold deposits and geological mapping at El Callao, Edo. Bolivar, Venezuela, where he spent the summer of 1960.

Before assuming his teaching position here at the University, Dr. Coleman also taught mineralogy, petrology and structural geology at Lafayette College, Easton, Pa., (1956-57), and mineralogy, X-ray crystallography and crystal chemistry at the Ohio State University, Columbus, O., (1957-60).

While at Princeton University Dr. Coleman worked with Dr. H. H. Hess on the unit cell dimensions of clinopyroxenes and during the last few years has extended this study to an investigation of the effects of ionic substitutions on the optical properties and unit cell dimensions of clinopyroxenes using synthetic analogues.

During the coming summer, Dr. Coleman plans to spend several months working on clinopyroxenes at the University and may also go back to Venezuela for several months.

Dr. M. W. Steevon * * * * *

Dr. J. R. Smith - Saskatchewan Research Council

As of July 1, 1960, Dr. Smith became full-time head of the Geology Division of the Saskatchewan Research Council. The work of the Geology Division of the Council and that of the Geology Department of the University is intimately associated in studies of mutual interest. Through the combined efforts of the two departments in the past, much progress has been made and Dr. Smith expresses a strong desire for this relationship to continue.

During the summer of 1960, Dr. Smith sampled the Birch Lake, Coronation and Hanson Lake areas, and is presently engaged in a study of trace elements and metamorphism (along with Dale Pyke) of these areas.

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Dr. E. A. Christiansen - Saskatchewan Research Council

The ground-water section of the Saskatchewan Research Council made great strides in 1960 toward the completion of a hydro geological study of the southern part of the province. The first report by the Geology Division of the Saskatchewan Research Council entitled "Geology and Ground-water Resources of the Qu'Appelle Area, Saskatchewan" by E. A. Christiansen was published in 1960. Geohydrological studies of the Regina area (72T) by E. A. Christiansen and the Willowbunch Lake area (72H) by R. R. Parizek were completed during 1960. The reports of these areas will be published in 1961. Studies of this nature were also started in the Last Mountain Lake (72P) by J. G. Greer and in the Great Sand Hills area (72K) by P. P. David.

Ground-water studies of a more quantitative nature were started in the Province in 1960. A drilling and pump-testing program was conducted in the buried Yellowstone Valley near Estevan where preliminary data indicate that large supplies of ground water are available.

In the hydro geological studies of southern Saskatchewan the Pleistocene deposits are emphasized because bedrock for the most part is not suitable for potable water. The studies includes the compilation of geological maps, bedrock surface topographic maps, and ground-water probability maps which show occurrence and probability of ground water.

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Dr. M. W. Steeves - Palynological Investigations in Saskatchewan

The annual incorporation of pollen and spores in accumulating sediments in bogs, lakes and deltas and the preservation thereof provides a widespread record of plant life on land. Variations in the pollen content of these sedimentary deposits are a reflection of climatic influences or result from evolutionary changes within the plant kingdom. In dealing with older deposits, those of pre-Cretaceous age, the emergence of new groups of plants and the extinction of others is one of the basis of stratal correlation. Among younger sediments, major climatic fluctuations result in floristic differences within the framework of modern groups and these floristic

associations may be utilized for correlative purposes. This technique, known as pollen analysis, is especially valuable in studying terrestrial sediments in which invertebrate microfossils do not occur.

The subject of the present study being conducted at the University of Saskatchewan is an analysis of Jurassic and Cretaceous sediments for fossil pollen and spores in an attempt to gain a stratigraphical and statistical record of vegetational changes both climatic and evolutionary. An analysis of the Lower Cretaceous Blairmore formation is in progress. The Jurassic and Cretaceous periods are considered critical. The origin of the flowering plants and their rise to a position of dominance among land plants occurred during this time. For this reason representatives of modern genera often are found in Cretaceous sediments and in order that they may be identified a reference collection of modern pollen is now being prepared. In addition, representatives of extinct groups also occur. These are extremely interesting because of their evolutionary significance in relation to the origin and dispersal of the angiosperms and because of the probability that their relative abundance in Jurassic sediments would facilitate the Jurassic-Cretaceous separation.

In addition, the study is being extended into Upper Cretaceous sediments with a survey of the microfossils occurring in the Belly River formation. Ultimately, this work will overlap with work on Tertiary and Pleistocene deposits. To this end a preliminary analysis of post-glacial deposits from Lac la Ronge was initiated recently. By these methods it is hoped eventually to provide a picture of the evolution of the flora of Saskatchewan.

Behind an able man there are always other able men, says a Chinese proverb.

Most of us are broadminded; in an argument we see both points of view, the one that is wrong and our own.

Thanks to everyone who has contributed in any way to the 1960-61 edition of the Concentrates.

Flash! Flash! Flash! Dr. Byers is working on a secret project.

Mr. F. Agar, Exp. Officer for Shell Oil Company of Canada, Regina, addressed the Ore Gangue on "Opportunities for Geology Students in the Oil Industry". Many varied questions arose in the ensuing discussion.

1959-60 SUPPLEMENT TO 1960-61 CONCENTRATES

Originally the 1959-60 edition of the Concentrates was to be incorporated in a special edition of the Concentrates in celebration of the Golden Jubilee of the University. This publication has been unfortunately delayed and so it was felt that a supplement be added to the regular Concentrates this year to review the activities of the Ore Gangue in 1959-60.

1959-60 Executive

President - M. A. Roed
Vice-president - D. Ruse
Secretary-Treasurer - L. D. Ayres
P. R. O. - G. Sorli
Sports - H. Morton
Special Concentrates Committee - C. Muirhead,
R. Burkhart,
B. Masley,
D. Andrews,
E. Zederayko,
D. Coulombe.

Highlights of 1959-60

The fall banquet was held in the Zebra Room of Golf's restaurant which was preceded by a tour of the Bavarian Club brewery and a cocktail hour respectively. The occasion was well attended by over eighty Ore Ganguesters old and new. During the cocktail hour the feature entertainment was a "boat-race" between the "soft-rockers" and "hard-rockers". The "soft-rockers" emerged victorious because Goldak spilled his beer down the front of his shirt. After the turkey dinner a period of joke-telling ensued and resulted in a competition between Goldak and Dr. Kupsch. The Greystone Trio then took over and presented a variety of "folk" songs which were received with great enthusiasm. The evening was concluded with several hours of dancing to a three piece orchestra.

Due to a disappointing and extraordinary heavy snowfall on the Thanksgiving weekend the annual geological field trip had to be cancelled.

Sandra Wood, a second-year Arts and Science student, was chosen the Geological representative in competition for the Engineering Queen. We proudly extend congratulations to Sandra as she was unanimously victorious. Sandra was also presented with an honorary membership to the Ore Gangue.

Mr. F. Agar, Exploitation Engineer for Shell Oil Company of Canada, Regina, addressed the Ore Gangue on "Opportunities for Geology Students in the Oil Industry". Many varied questions arose in the ensuing discussion.

Upon a brief visit to the Geology Department, Mr. P. F. Moore, Area Geologist for Shell Oil Company of Canada, in Calgary (now in The Hague) took time to talk to the Ore Gangue on "A Classification of Carbonate Rocks." Mr. Moore's presentation mainly centred around Folk's, and Brankamp and Power's theory of environmental energy levels.

Dr. Ira Brown of the Geological Survey of Canada spent some time in Saskatoon and gave several lectures to the geology students, mainly on the topic of the Yellowknife Greenstone Belt and the origin of the gold. A separate talk to the Ore Gangue included the Precambrian geology of the Northwest Territories and opportunities for employment with the Geological Survey of Canada.

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An interesting talk was given to the Ore Gangue by Mr. J. W. Young, Manager of Production Research for Imperial Oil, Limited, Calgary. His talk dealt with various problems of reducing fire hazards in gas wells, which was accompanied with results of field and laboratory experiments.

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Six or seven students led by D. Horn constructed a valuable representative section of the stratigraphy of southern Saskatchewan, which now ornaments a good portion of the wall in the "Paleo-lab".

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In January a cavalcade of 15 people from the Geology Department journeyed to Calgary for the First International Symposium on Arctic Geology held in the new auditorium. The representatives included Drs. Mawdsley, Kupsch and Caldwell from the faculty, and R. North, L. Rainsberry, D. Delorme, K. Evans, L. Ayres, M. Roed, O. Miedema, D. Sykes, E. Zederayko, and D. Andrews from the graduate students. The symposium was thoroughly enjoyed by all. Travelling expenses were provided by the Geology Department.

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In March the annual spring banquet in honour of the graduating students was held in the Zebra Room. The Ore Gangue was honoured by the presence of Dr. B. W. Currie who gave an interesting and vivid account of his trip to Russia in connection with the International Geophysical Year accompanied by excellent coloured slides. Mrs. Sins attended the banquet this year and thus added to the success of the occasion. The "Thunderbirds" provided "rock and roll" entertainment for the latter part of the evening.

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